Visualization of multi temporal information from semantic Earth observation data cube

Diploma Thesis

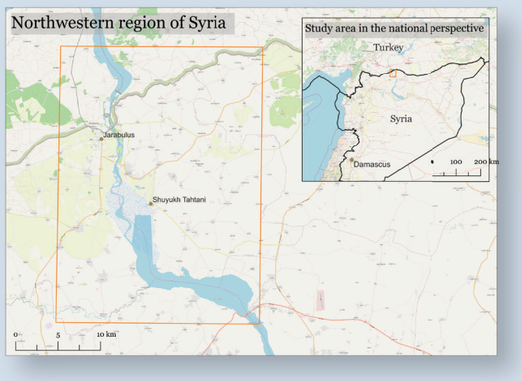
Objectives

- **Process** the multi temporal information obtained from Sen2Cube.at
- **Develop** a workflow for interactive web based visualization.
- **Implementation** of the developed workflow.

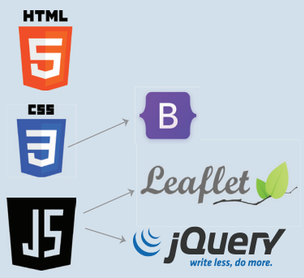
world's first prototype of semantic EO data cube

Study areas

- Salzburg, Austria
- North western Syria



Methodology

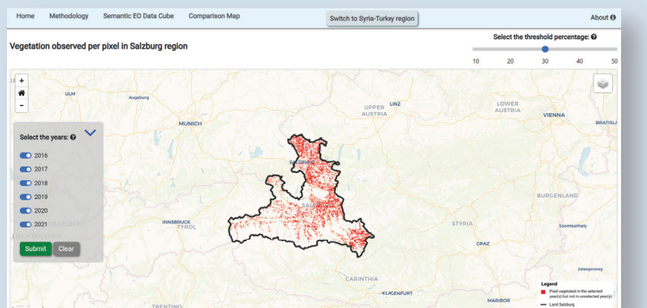


QGIS and Python	GeoServer	HTML, CSS and JavaScript	GitHub pages	Google Form
Pre processing	**Data hosting**	**Visualization**	**Web app hosting**	**User evaluation**
• Raster thresholding • Raster addition • Generation of new rasters • Generation of style files	• Hosting newly created rasters • Hosting style files • Publishing OGC Web Map Services (WMS) maps	• Creation of interactive web map application	• Deploying the application on GitHub pages	• Online questionnaire based user evaluation to evaluate the overall web application

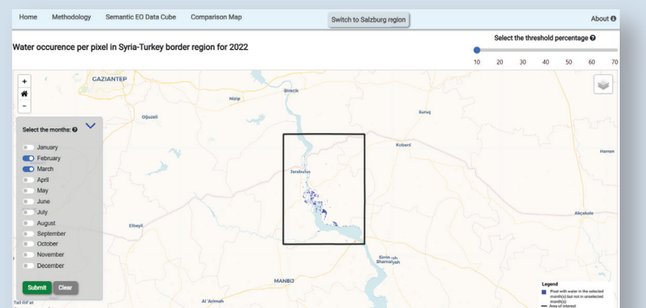
Results

The main output of the thesis is the interactive web map application demonstrating two use cases; yearly vegetation in Salzburg, Austria from 2016 to 2021 and monthly water occurrence in north western Syria for 2022. Users can also compare two or more time period with the comparison map feature present in the application. In addition to that, the thesis also presents a detailed workflow for visualizing other similar multi temporal information. A subjective user evaluation of the app was also performed. Most of the participants liked the approach for visualization but it was also found that the information presented was not intuitive for some users.

Access the application here



Vegetation in Salzburg region



Water occurrence in north western Syria

Conclusion

Multi temporal information can be visualized in a better way capitalizing on the use of GIS and modern web technologies. The interactive components of the web map applications assist users to understand the spatio-temporal patterns of the data. However, considerations should be taken on the user-friendly interface and overall usability of the application.

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